## REMARKS

Applicants request favorable reconsideration and allowance of the subject application in view of the preceding amendments and the following remarks.

Claims 52-82 are presented for consideration. Claims 52-54, 57-59 and 82 are independent. Claims 31-51 have been canceled without prejudice or disclaimer. Claims 52-54 and 56-59 have been amended to clarify features of the subject invention, while claims 60-82 have been added to recite additional features of the subject invention. Support for these changes and claims can be found in the original application, as filed. Therefore, no new matter has been added.

Applicants request favorable reconsideration and withdrawal of the rejections set forth in the above-noted Office Action.

Claims 31-54 were rejected under 35 U.S.C. § 103 as being unpatentable over Japanese patent document number 5-217837 to Nishida et al. Claims 55-59 were rejected under 35 U.S.C. § 103 as being unpatentable over the Nishida et al. document in view of U.S. Patent No. 5,243,377 to Umatate et al. Applicants submit that the cited art, whether taken individually or in combination, does not teach many features of the present invention, as recited in the claims. Therefore, these rejections are respectfully traversed.

In one aspect of the present invention, independent claim 52 recites a stage position measurement method for measuring a position of a stage movable at least in a long stroke along a first direction and a short stroke along a second direction. The method includes the steps of irradiating first and second laser beams for measuring a position of the stage in the first and

second directions with a first optical unit arranged outside the stage and a second optical unit arranged on the stage, splitting the first and second laser beams into first and second reference beams, and first and second measurement beams, by the first and second optical units, irradiating the first and second measurement beams with a first reflection unit arranged on the stage and a second reflection unit arranged outside the stage, reflecting the first and second measurement beams irradiated with the first and second reflection units, making the reflected first and second measurement beams and the first and second reference beams interfere to generate first and second interference beams, detecting the first and second interference beams, and measuring a position of the stage on the basis of a signal concerning the detected first and second interference beams.

In another aspect of the present invention, independent claim 53 recites an exposure apparatus including as a reticle stage and/or a wafer stage, a stage apparatus having a stage movable at least on a long stroke along a first direction and a short stroke along a second direction, a first optical unit which is arranged outside the stage and splits a first laser beam for measuring a position of the stage in the first direction into first reference and measurement beams, a second optical unit which splits a second laser beam for measuring a position of the stage in the second direction into second reference and measurement beams, a first reflection unit which is arranged on the stage and reflects the first measurement beam, a second reflection unit which arranged outside the stage and reflects the second measurement beam, a first detector which is arranged outside the stage and detects an interference beam of the first measurement and

reference beams, and a second detector which is arranged outside the stage and detects an interference beam of the second measurement and reference beams.

In yet another aspect of the present invention, independent claim 54 recites a semiconductor device manufacturing method including the steps of installing, in a semiconductor manufacturing factory, manufacturing apparatuses for performing various processes, the manufacturing apparatuses including an exposure apparatus which includes as a reticle stage and/or a wafer stage, a stage apparatus having a stage movable at least in a long stroke along a first direction and a short stroke along a second direction, a first optical unit which is arranged outside the stage and splits a first laser beam for measuring a position of the stage in the first direction into first reference and measurement beams, a second optical unit which splits a second laser beam for measuring a position of the stage in the second direction into second reference and measurement beams, a first reflection unit which is arranged on the stage and reflects the first measurement beam, a second reflection unit which is arranged outside the stage and reflects the second measurement beam, a first detector which is arranged outside the stage and detects an interference beam of the first measurement and reference beams, and a second detector which is arranged outside the stage and detects an interference beam of the second measurement and reference beams.

In still another aspect of the present invention, independent claim 57 recites a semiconductor manufacturing factory including manufacturing apparatuses, for performing various processes, the manufacturing apparatuses including an exposure apparatus which includes as a reticle stage and/or a wafer stage a stage apparatus having a stage movable at least

in a long stroke along a first direction and a short stroke along a second direction, a first optical unit which is arranged outside the stage and splits a first laser beam for measuring a position of the stage in the first direction into first reference and measurement beams, a second optical unit which splits a second laser beam for measuring a position of the stage in the second direction into second reference and measurement beams, a first reflection unit which is arranged on the stage and reflects the first measurement beam, a second reflection unit which is arranged outside the stage and reflects the second measurement beam, a first detector which is arranged outside the stage and detects an interference beam of the first measurement and reference beams, and a second detector which is arranged outside the stage and detects an interference beam of the second measurement and reference beams, a local area network for connecting the manufacturing apparatuses, and a gateway which allows the local area network to access an external network outside the factory. Information about at least one of the manufacturing apparatuses can be communicated.

In a further aspect of the present invention, independent claim 58 recites a maintenance method for an exposure apparatus which is installed in a semiconductor manufacturing factory, and includes as a reticle stage and/or a wafer stage a stage apparatus having a stage movable at least in a long stroke along a first direction and a short stroke along a second direction, a first optical unit which is arranged outside the stage and splits a first laser beam for measuring a position of the stage in the first direction into first reference and measurement beams, a second optical unit which splits a second laser beam for measuring a position of the stage in the second direction into second reference and measurement beams, a first reflection unit which is arranged

on the stage and reflects the first measurement beam, a second reflection unit which is arranged outside the stage and reflects the second measurement beam, a first detector which is arranged outside the stage and detects an interference beam of the first measurement and reference beams, and a second detector which is arranged outside the stage and detects an interference beam of the second measurement and reference beams. The method includes the steps of causing a vendor or user of the exposure apparatus to provide a maintenance database connected to an external network of the semiconductor manufacturing factory, authorizing access from the semiconductor manufacturing factory to the maintenance database via the external network, and transmitting maintenance information accumulated in the maintenance database to the semiconductor manufacturing factory via the external network.

In a still further aspect of the present invention, independent claim 59 recites a stage apparatus including a stage movable along at least a first direction and a second direction, wherein the stage is movable in a stroke along the first direction, which is longer than a stroke in the second direction, and an interferometer which measures a position of the stage. The interferometer has a first reflection unit which is arranged on the stage and measures the stage in the first direction and a second reflection unit which is arranged outside the stage and measures the stage in the second direction.

In yet another aspect of the present invention, independent claim 82 recites a stage apparatus including a stage movable at least in a long stroke along a first direction and a short stroke along a second direction, and an interferometer which measures a position of the stage. The interferometer has a first reflection unit which is arranged on the stage and measures the

stage in the first direction and a second reflection unit which is arranged outside the stage and measures the stage in the second direction.

With the above arrangements and methods, since first and second detectors can be arranged outside the stage and it is not necessary to arrange a relatively large first reflector on the stage for the long stroke direction, the weight of optical devices arranged on the stage can be decreased and accuracy in controlling and positioning the stage can be increased.

Nishida et al. describes an X-Y movement table. In Figure 2, both mirrors are arranged on the stage and the detectors are arranged outside the stage, while in Figure 1 the mirrors are arranged outside the stage and the detectors are arranged on the stage. The Examiner suggests that it would have been obvious to combine the two embodiments in Nishida et al. so as to provide one mirror on the stage and another mirror outside the stage because such would be merely rearranging parts involving only routine skill in the art. Applicants respectfully disagree. Nishida et al. clearly shows distinct embodiments where the mirrors are either both on the stage or both removed from the stage. There is no disclosure or suggestion of mixing the positions of the mirrors and detectors. To pick and choose the positions of the various components from two separate embodiments is impermissible hindsight based solely on Applicants' disclosure.

Moreover, the claims specifically recite which of the reflection units is arranged on the stage, namely, the reflection unit that reflects in the first long stroke direction. To select only the mirror used for reflection in the long stroke direction to be positioned on the stage in Nishida et al. is an even more extreme case of impermissible hindsight, without any specific motivation or suggestion outside of Applicants' specification.

Accordingly, Nishida et al. fails to disclose or suggest at least a first reflection unit arranged on the stage and a second reflection unit arranged outside the stage, with the first reflection unit being for measuring the position of the stage in a first (long or longer stroke) direction.

Thus, Nishida et al. fails to disclose or suggest important features of the present invention recited in the independent claims.

Umatate et al. was cited for teaching plural exposure apparatuses, a host management system and a network interface. However, Umatate et al. is not believed to remedy the deficiencies of Nishida et al. noted above with respect to the independent claims.

In view of the foregoing, reconsideration and withdrawal of the § 103 rejections are requested.

For the foregoing reasons, Applicants submit that the present invention, as recited in independent claims 52-54, 57-59 and 82, is patentably defined over the cited art.

Dependent claims 55, 56 and 60-81 also should be deemed allowable, in their own right, for defining other patentable features of the present invention in addition to those recited in their respective independent claims. Further individual consideration of these dependent claims is requested.

Applicants further submit that the instant application is in condition for allowance. Favorable reconsideration, withdrawal of the rejections set forth in the above-noted Office Action and an early Notice of Allowance are requested.

Applicants' attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should be directed to our address listed below.

Respectfully submitted,

Attorney for Applicant
Mark A. Williamson
Registration No. 33,628

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200